The Mining Journal

LONDON, OCTOBER 19, 1956

Vol. 247. No. 6322. Price Ninepence

Atlas Copco produce world's lightest motor drill

From Atlas Copco, the world's largest manufacturers of pneumatic rock-drilling equipment, comes an entirely new motor drill. It is the Atlas Copco *Cobra*, backed by 50 years' experience of rock-drilling equipment, and developed after extensive field tests.

Weighing a mere 53 pounds, the Atlas Copco *Cobra* is undoubtedly the lightest, handiest motor drill ever brought out. (The usual weight of a motor drill is around 80 pounds.) Yet despite its low weight the Cobra is able to put up a *higher footage* under actual working conditions than other, *heavier* motor drills. It is powerful, robustly constructed and, above all, *100 per cent self-contained!* One man can carry it and start it up *anywhere*.

New exclusive drill features

The Atlas Copco Cobra has 100 per cent air flushing from the built-in compressor. As no exhaust gases are used for flushing, troublesome decarbonizing is eliminated. Another *first-ever* feature is the free-wheeling mechanism for easier starting and more rapid steel changes. The Cobra also incorporates a unique new method of automatic rotation of the drill chuck, a floatless carburettor enabling drilling up to a 45 degree incline and a pull-type starter. The Cobra drills 100 feet to the gallon, has a drilling rate of 26 feet per hour, and can drill holes up to 13 feet in depth.

The right steels for the Cobra

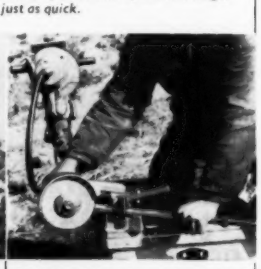
The Cobra—like all Atlas Copco drills—has been developed for use with *Sandvik Coromant* steels, the world's most widely-used integral drill steels. This, of course, adds considerably to the performance of the Cobra. *No drill or steel developed separately could possibly give such equivalently high results.* Atlas Copco drills fitted with Sandvik Coromant steels have proved an unbeatable drilling unit, responsible for the drilling of no less than one billion feet each year.

World-wide sales and service

The Atlas Copco Group embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world. For further details of the equipment featured here, contact your local Atlas Copco Company or Agent, or write to Atlas Copco AB, Stockholm 1, Sweden.

Motor Drill and Breaker in one!
The Cobra converts to breaker in minutes. Only three small parts to change. Reconversion just as quick.

Easily carried anywhere! *Perfectly-balanced carrying handle. Moulded back frame for transporting cross-country.*



Grinder driven from the Cobra! *A specially light drill steel grinder, powered through the crankshaft, can be supplied if required.*

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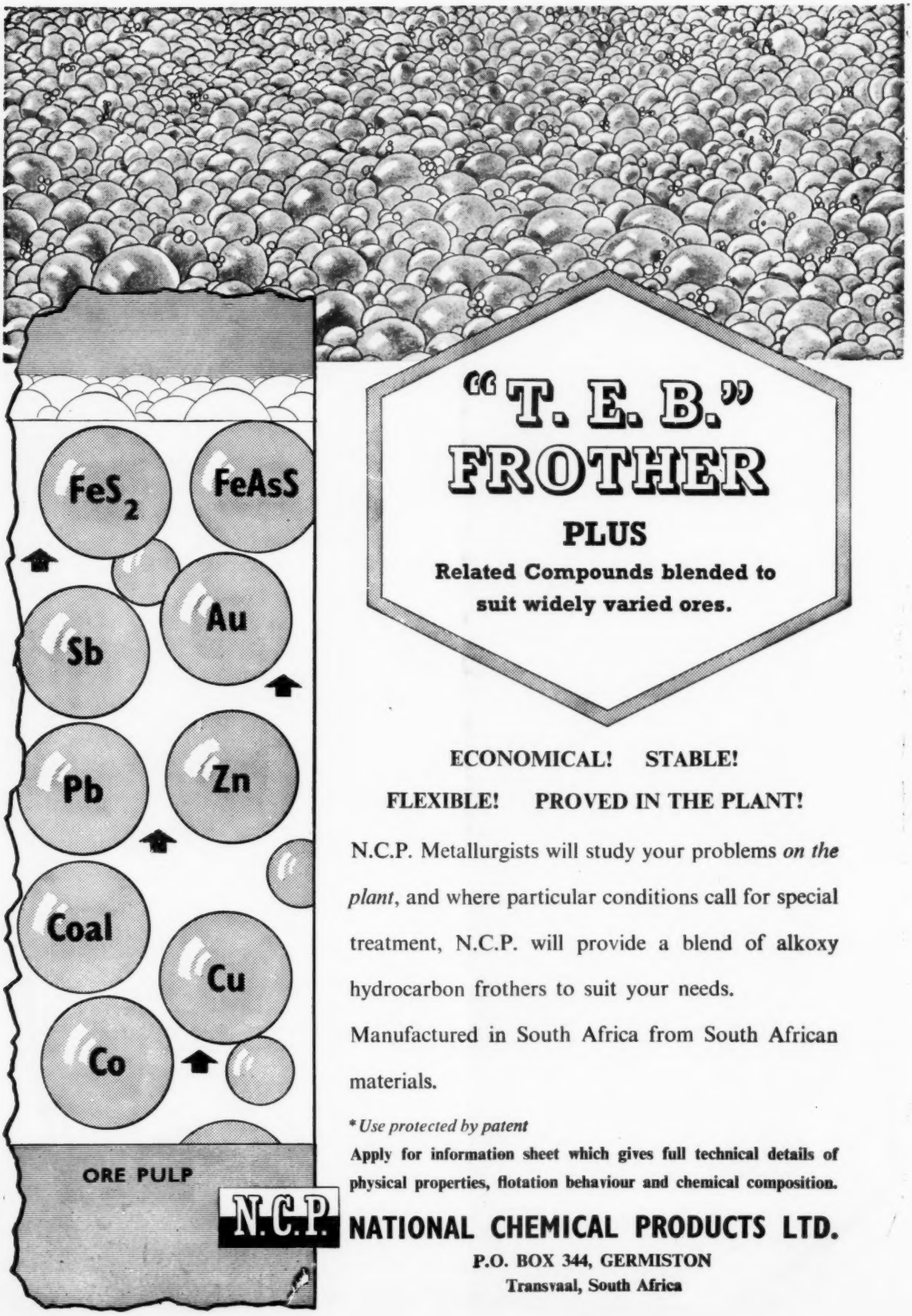
Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment



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There's no rougher, tougher load for conveyor belting than Welsh granite . . . and there's no belting better able to " take it " than BTR belting. This 42" belt, for example, at the quarries of Penmaenmawr & Welsh Granite Co. Ltd, travelling at 300 ft. per minute, carries 600 tons of granite an hour . . . granite in irregular, jagged pieces often weighing up to 1 cwt . . . and carries it, moreover, at 1200 ft. above sea level where the belt is exposed to the most adverse climatic conditions. Yet after more than three continuous years of such service this belt is in good condition still. If your load is a tough one—specify BTR Belting.

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D1139

THIS OR THIS

AFTER 6 MONTHS OF EXPOSED OPERATION

Using normal greases these exposed gears on heavy outside machinery were useless (based on actual report). Dirt laden, constantly wet conditions and heavy pressure had taken their toll. Lubricant film had broken down, grease had dried out and in spite of frequent re-greasing gears became chipped, worn and battered by bad meshing under pressure.

AFTER 4 YEARS USING VOLER COMPOUNDS

Following upon the use of VOLER COMPOUNDS the exposed gears have run silently and smoothly for over 4 years and are still in service, with lubrication periods reduced by 75% and negligible maintenance.

Voler outlasts normal greases up to 8 times

WHAT ARE VOLER COMPOUNDS?
VOLER COMPOUNDS are 'all lubricant' lubricants containing Superfine Graphite, one of the finest lubricants known. In addition VOLER COMPOUNDS include a unique non-corrosive and anti-corrosive element having 'Extreme Pressure' characteristics. No bituminous or similar carriers are employed.

ENORMOUS FILM STRENGTH
On heavy grades VOLER COMPOUNDS have a film strength equal to 80,000 p.s.i. (standard greases, etc., rate 16,000/26,000 p.s.i.). This film strength is obtained with viscosities of less than $\frac{1}{3}$ that of normal compounds, giving reduced drag, higher efficiency with lower power consumption.

VOLER COMPOUNDS PREVENT GEAR DAMAGE
The special grades of VOLER COMPOUNDS are NON-DRYING and, because of the unique E.P. additives and Superfine Graphite used, the rate of oxidation is reduced to a minimum — this means NO LUMPING, NO CHANNELLING, and no pitting or scuffing and fewer broken teeth due to these causes.

REPELS DUST AND GRIT
With VOLER COMPOUNDS dust and grit unavoidably absorbed by the fluid base are squeezed out over the greasy Graphoid film and are out of harm's way, the graphite safety film remaining.

The firm graphite film formed, with its small fluid content, CAN ABSORB UP TO 40% IN WEIGHT OF FOREIGN MATTER before being affected as a lubricant.

VOLER COMPOUNDS WITHSTAND WATER
VOLER COMPOUNDS are thoroughly water and moisture repellent. Under continuously wet conditions — even immersed in salt water — the lubricating value is unaffected.

VOLER COMPOUND

for exposed gears
chain drives · wire ropes · cables

VOLER THREAD LUBRICANT prevents metal-to-metal seizure

VOLER DRYLUBE, the special graphite lubricant where cleanliness is essential

REVOL LIMITED *EXCHANGE BUILDINGS, QUAYSIDE, NEWCASTLE-UPON-TYNE Newcastle 22480*

P.3564A

ONE BILLION FEET DRILLED EACH YEAR WITH THESE STEELS

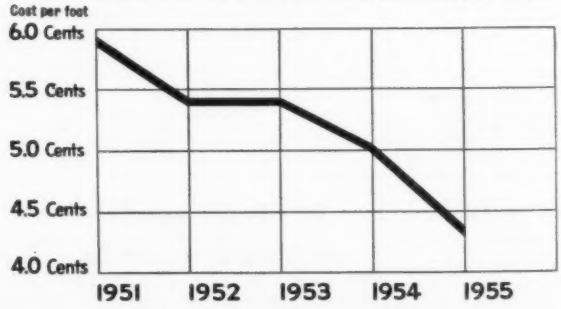
For many years Sandvik Coromant steels have been the world's most widely-used integral drill steels. And as each year passes, their share of the world rock drilling market becomes even larger; responsible for drilling one billion feet annually. The reason behind this ever-increasing demand is their consistently high and uniform quality.

Meticulous production control

Sandvik control every phase of production, from the mining of iron ore and processing of the wolfram ore, to the final tungsten carbide-tipped drill steels. This 'under-one-roof' policy of Sandvik has produced steels of a quality that is always improving; steels that have brought *faster* speeds and *new* economies to drilling. The production of Sandvik Coromant steels is not only strictly controlled, but also influenced by valuable information gained from extensive research. Every year, with the close co-operation of Atlas Copco, hundreds of miles of test drilling is carried out both in Sandvik's own test mine and under actual working conditions.

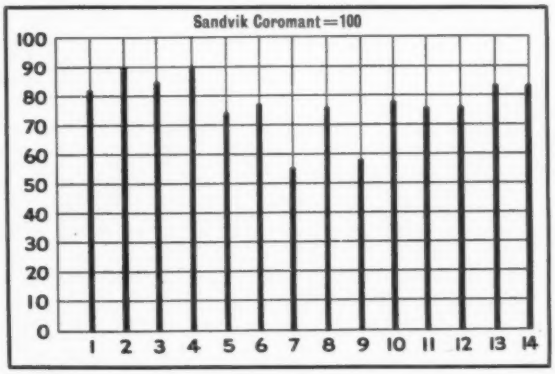
Increased quality brings lower drilling costs

Since the introduction of Sandvik Coromant steels some ten years ago, their quality and life has been continually increased. A longer life means *lower* drilling costs. For example, take the costs of a well-known Canadian mine shown in the graph below.



You'll notice that the cost per foot with Sandvik Coromant steels has decreased by 25% in just four years!

On large-scale drilling tests carried out during 1954-56 at leading Swedish mines and construction projects with different makes of drill steels, Sandvik Coromant steels again proved superior, showing the highest and most uniform quality. The final results gave Sandvik Coromant steels the highest average footage per steel. Here are the average footages of other steels taking part in the 14 tests, compared to the performance of Sandvik Coromant steels, shown as 100.



Sandvik Coromant steels are supplied through the Atlas Copco Group. It is the largest group of companies specialising solely in the development and manufacture of compressed air equipment. It embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world. For further details of the equipment featured here, contact your local Atlas Copco Company or Agent. If you have any difficulty please write to Atlas Copco AB, Stockholm 1, Sweden.

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De-Nationalizing Steel in Rhodesia

THE announcement that financial arrangements have been completed for the development of the Rhodesian iron and steel industry may well establish a new point of departure for assessing the future growth possibilities of the Central African Federation in particular, and in other Commonwealth countries where the problem of securing the necessary finance is the principal obstacle to any dynamic expansion.

According to yesterday's announcement from the Southern Rhodesian government, a new Rhodesian public limited liability company called The Rhodesian Iron and Steel Corporation Limited will be formed to take over the present responsibilities connected with controlling and developing the Rhodesian Iron and Steel Commission, as soon as agreement with all the interested parties has been concluded.

The companies likely to be involved in this new undertaking include the Lancashire Steel Corporation, Stewarts and Lloyds, the Colonial Development Corporation, Anglo American Corporation of South Africa, Messina (Transvaal) Development Company, Rhodesian Selection Trust and The British South Africa Company. These companies, together with the Southern Rhodesian Government, are all expected to contribute a portion of the equity capital. While no one company will have a controlling interest, the Lancashire Steel Corporation and Stewarts and Lloyds will be directly responsible to the Board for the development programme of the iron and steel works at Redcliffe and Bulawayo which are to be developed to conform with a more economic unit and to provide a greater tonnage and variety of steel products.

The principal objective is to develop the country's large iron ore deposits owned by the Southern Rhodesian government through RISCOM and by the Messina (Transvaal) Development Company, and to expand pig iron output over the next four or five years. The total development cost of this programme is estimated at approximately £8,000,000 which will cover the erection of coke ovens, sintering plant, a large blast furnace, and two additional open hearth furnaces as well as the expenditure in connection with extensive alterations to the rolling mills and the acquisition of the iron ore reserves.

Not all of the money is to be provided in the form of equity capital. Loan finance will be provided by the Southern Rhodesian government re-investing part of its stake in the present Commission in equity shares of the new company and the balance in 4 per cent. second debenture stock maturing in thirty years. In order to assist the development programme the Government will re-invest all interest accruing in the first five years.

The importance of this project to the Central African Federation cannot be too strongly emphasized. In one way, it may be viewed as but a further implementation of the policy described by Mr. R. L. Prain as a determined attempt to rectify the economic imbalance of the territory by promoting complementary industries to counter-balance the predominant influence exercised by the Northern Rhodesian mining industry. Indeed, it may be recalled that Mr. Prain, in his informal talk to British and American stock-

holders in London and in New York last year, said that his group would promote industries other than mining throughout the Central African Federation. What Mr. Prain described as a sense of responsibility to the comunity and Mr. Harry Oppenheimer described as enlightened self-interest is, in terms of deeds, one and the same thing. In fact, Rhodesian Selection Trust, Anglo American Corporation of South Africa, The British South Africa Company, the Colonial Development Corporation, and to a much lesser extent, Messina (Transvaal) Development Company have all made valuable contributions in the past to the development of Central and East Africa.

But the participation of the Lancashire Steel Corporation and Stewarts and Lloyds in fostering the growth of primary and secondary industry in overseas territories is an encouraging feature (the participation of British Insulated Callender's Cables in the construction of the Ndola Copper Refineries last year is another), and one which may well set the pattern by which this country could develop other important sources of raw materials in the Commonwealth and, in so doing, materially aid London to retain its position as the mining finance centre of the world.

MINING EXPANSION IN EIRE

At least six Canadian groups are now operating in Eire, three of which have subsidiary companies at work. These subsidiaries are St. Patrick's Copper Mines Ltd., the Mining Corporation of Ireland Ltd., and the Emerald Isle Mining Co. Ltd.

St. Patrick's Copper Mines took over control of the Avoca Mines a year ago. As a result of exploratory work it is satisfied that arrangements for commercial production can be made. Work is in progress on the construction of a 7,000 ft. tunnel designed to open up the ore bodies for production. This tunnel is already over 1,000 ft. long. Preparatory work for the installation of the concentrator is in hand and the construction of workshops and houses is under way. The company has already spent over £500,000 on operations at Avoca and estimates that it will require to spend a further £1,750,000 during the next year or so to bring the mine into production. About 250 men are now employed in the mine, which expects to go into production towards the end of next year.

Exploratory work is being carried out by the Mining Corporation of Ireland at Beauparc, Co. Meath, where there are copper deposits, and at Castleblayney, County Monaghan, where there are deposits of lead and zinc. The company is to spend at least £35,000 in the next year on exploration. At Beauparc, the company is de-watering an old mine and conducting diamond drilling operations.

The Emerald Isle Mining Co. is engaged in exploratory work at Allihies, Co. Cork, where there are copper deposits. The company is at present pumping water out of old workings and has provided assurances to the Eire Government that it has almost £100,000 available for exploratory work. At present it employs about 50 men.

The Eire Minister for Industry and Commerce, Mr. Norton, stated recently that he hoped to conclude negotiations soon with another group which is prepared to spend at least £150,000 during the next year or so on exploratory work in four areas. These are Bonmahon, Co. Waterford, where copper was mined on a substantial scale in the last century; Roaring Water Bay near Skibbereen, Co. Cork, and Kenmare, Co. Kerry—in both of which there are copper occurrences; and East Clare, where there are occurrences of copper, lead and zinc. The Minister said that the group had all these areas examined by highly qualified geologists and mining engineers, who were optimistic about the outcome of the exploratory work.

The Minister has received a proposal from another group, which wishes to spend about £35,000 on preliminary examination of the mineral potentialities of Counties Galway and Mayo. A number of applications for prospecting facilities in respect of copper occurrences in the vicinity of Hollyford, Co. Tipperary, have also been received and are under consideration by the Government.

Mr. Norton said that there were other unworked deposits in the country in respect of which he has not yet received proposals. A considerable fund of information about such deposits is on record in the office of the Geological Survey. This information will be made freely available to any interested person and the Survey will give all assistance in its power to any person or group wishing to formulate proposals for the exploration and development of unworked deposits.

The Government of Eire grants special tax concessions in respect of new mining projects or new developments in areas where there are working mines.

The possibility of setting up a smelter in Eire has been mooted by the Minister, who stated that if current exploratory mining work in the Republic resulted in large producing mines, it could reasonably be hoped that this would lead to the establishment of smelting and refining capacity within the country.

Referring to the possible purchase of a smelter, Mr. Norton said this would depend on the total volume of concentrates from the Eire deposits. He pointed out that the establishment of a smelting plant would result, among other things, in the production of sulphuric acid from which fertilisers could be made. Concentrates could be brought to Eire for treatment, thus helping to relieve the present world shortage of smelting capacity.

A Canadian mining expert has said that the provision of a copper smelter, though a costly undertaking, might prove economic if present hoped for returns from the newly-opened mines in Eire were fully realised. He was of the opinion that a worthwhile percentage of the ore smelting work currently going to the Continent could be won for Eire if smelting facilities existed in the Republic.

Saint Patrick Mines are planning at present to ship ore through the nearby port of Arklow for smelting on the Continent. The ore production of the other copper mines recently opened in Eire will also have to be sent abroad for smelting.

BRITAIN AND THE FREE TRADE AREA

Now that the mists engendered by conflicting accounts from Washington have been dispelled by official statements, Mr. Macmillan's proposals for economic association with Europe can be seen in clearer perspective. Contrary to early reports, the Chancellor put forward no scheme for a vast free trade area embracing both Europe and the Commonwealth. While at Washington, however, he took the opportunity of examining with the Commonwealth finance ministers the problem of creating freer trade in Europe and at the same time maintaining the great structure of Commonwealth trade.

Much has already been done to increase trade within Europe since the end of the war. In fact, liberalization of trade through the European Payments Union has been one of the big successes of O.E.E.C. and to-day quota restrictions within Europe have been severely limited and in certain countries wiped out. While this movement has been

proceeding, six European governments have been working out ideas for a Customs Union and they have now reached an advanced stage in drawing up a treaty to put it into effect. Once the treaty is signed, these countries will begin to dismantle their tariff walls, which are to be abolished in stages over a period of perhaps 12-15 years. Britain might stand outside the Customs Union altogether, but if she chose to do so, her exports might be shut out from the member countries by higher tariff walls. On the other hand, membership of the Union is incompatible with the existing system of Imperial Preference within the Commonwealth.

A way out of this dilemma is now under consideration by the British and Dominion governments. It lies in the formation of a partial free trade area, consisting of the Customs Union of the six countries, Britain, and such other O.E.E.C. countries as wish to join. Whereas a Customs Union envisages a common tariff against all other countries, in a free trade area each country is free to preserve its own tariff against other countries outside the area.

The free trading area now under discussion would provide a common market of nearly 250,000,000 people. It would give Western European countries the advantages of large-scale production, which tend at present to be confined to the U.S. and the U.S.S.R. If it became strong and prosperous, it would also benefit the Commonwealth both as a market for materials and as a source of capital. The development of the Commonwealth cannot be adequately financed by countries with trade deficits. It is possible, too, that British participation, at an early stage, might be of assistance in securing more favourable treatment of Commonwealth goods by members of the free trade area.

Agricultural commodities would be excluded from the free trade area, while minerals and metals, generally speaking, are assured of ready access to European markets. Commonwealth exports, however, will not continue indefinitely to be confined mainly to agricultural produce and raw materials. Industrialization is proceeding apace in a number of Commonwealth countries. It is conceivable that a few years hence, when tariffs within the free trade area have been finally abolished, it might be found that the advantages of participation in the free trade area outweighed the benefits of Imperial Preference, which might then have outlived its present usefulness.

Membership of the free trade area must inevitably involve hardships to some industries, depending on the relative heights of existing tariff walls, but the long period over which reductions in tariffs are to be affected should allow any consequential changes in the pattern of British industry to be smoothly brought about. In fact, we believe that British and Western European manufacturers would soon be too busy striving to keep pace with the ever-mounting demands of the European and Commonwealth markets—perhaps some day the European-Commonwealth market—to be disturbed by the spectre of excessive competition.

MOTHBALL FLEET TO CARRY COAL TO EUROPE

After meeting strong objections from many major steamship lines the U.S. government has finally authorized American Shipping Incorporated to charter 30 mothballed Liberty Ships. A.S.I. is a company composed of the United Mineworkers' Union, seven coal producers and three railroads and expect to carry some 5,000,000 tons of coal to Europe next year. The Company contends that present export rates are too high and ultimately intends building its own collier fleet to carry an anticipated increased export trade.

In opposing permission nine shipping concerns stated that present transatlantic cargo rates may be depressed as a result of the operations of the new $50,000,000 combine. The Federal Board's reply has been that the coal export service to be provided by the A.S.I. was required in the public interest. If there was any evidence of resultant damage to the existing transatlantic cargo rates the Board would act at once, but meanwhile the charter would be for an indefinite period with a review in six months' time.

Whether or not freight prices change, the cost of American exported coal is bound to go up as a result of the new labour agreement negotiated between the miners' union and the operators. This gives the nation's 200,000 soft coal miners benefits totalling $2.40 a day over a one-year contract period. Daily wage rates go up $1.20 retrospective to October 1, 1956, with a further boost of 80 c. per day from April 1, 1957. Additional benefits to the miners include two extra days' holiday and implementing this will add a further 40 c. to the daily wages bill. These new gains keep the miners at the top of American industrial wage earners. With production running 10 per cent ahead of last year and market prospects good the operators anticipate little repercussions consequent upon the higher prices they have announced for pit head coal sales. These price increases range between 35 to 50 c. per ton and this will put the average price for bituminous coal up to about $5.40 per ton.

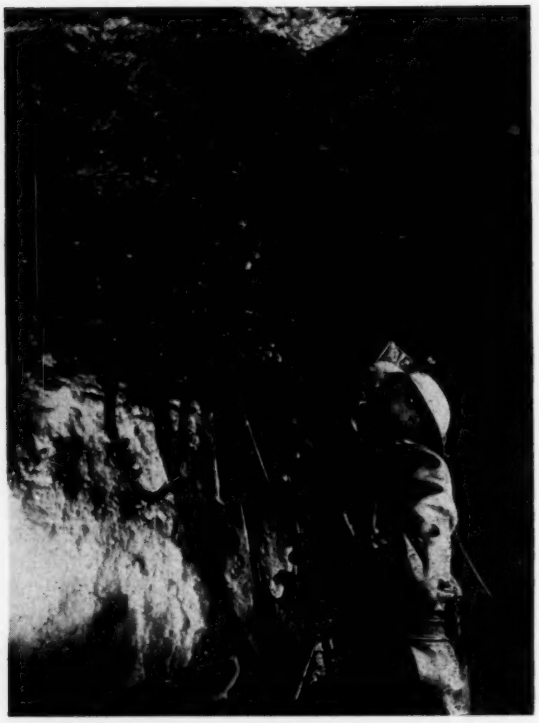
Despite the appreciable wage awards to the miners during the past few years the price of American coal has not increased greatly over the last decade. Mounting production costs have been compensated by significant increases in O.M.S. which now stands at almost 11 tons. This has been achieved by widespread introduction of bigger and better power loading machines.

TIN STUDY GROUP IN ECLIPSE

One of the problems that had arisen out of the ratification of the International Tin Agreement was the future of the International Tin Study Group. The Group's most important function was the issue of regular statistics on the tin-producing and consuming industries and, in addition, it made a custom of offering some forecast on the future of world supply and demand at its regular meetings. This function it has carried out admirably and the tin industry has been as well served by statistics as almost any other extractive industry—with the important reservation that figures on Bolivia have been hard to come by. However, the I.T.A. buffer stock manager will himself require statistics at least as detailed and certainly more up to date as those published by the Group before he can properly carry out his task.

The question was therefore should the Group continue to publish statistics which the Tin Council would also be requiring. Clearly there was no reason why the world's tin industry should support two organizations to measure its performance and the Group has come to the almost inevitable decision that it must close down its statistical work. Publication of figures and the employment of staff will cease as soon as possible and at any rate not later than June 30, 1957. The statistical archives of the group are to be given to the Tin Council which presumably will continue this publication from London.

The group will not, however, cease to exist. It will still meet (at unspecified intervals) to discuss matters "of common interest relating to tin." The reason for this curious decision to keep the Group in being is clearly the wish to provide an opportunity to discuss tin with the United States particularly (and also West Germany) since she does not belong to the I.T.A.



Mining Practice at Renström,

THE Renström ore deposit is located in the Parish of Jörn in the Province of Västerbotten, about 15 km. WNW of Boliden in the neighbourhood of the ore route Boliden—Kristineberg and about 1,200 m. NW of the aerial ropeway station at Renström. The Renström ore deposit is owned solely by the Boliden Mining Company.

The Renström ores are all embedded in the porphyry layers. It is the ore at the West Renström which is of most interest. This is tied to a zone of sedimentary rock between a lower bedding of quartz porphyry in the west and an upper bedding of dacite in the east. The dip is almost vertical and the field dip also almost vertical. The rocks surrounding the ore are weakly chlorite-calcite transformed and slightly schistous.

On the whole the ore shows sharp separation from the side rock. It varies considerably in thickness. The mother ore (A ore) consists of a compact continuous ore body, which runs from the surface down to a depth of at least 450 m. The B ore zone consists of a number of irregular formations at depths between 200 and 450 m.

The ore is composed of iron pyrites and sulphide of zinc as well as small and varying quantities of magnetic pyrites, copper pyrites, arsenical pyrites, and lead-antimony mineral. It also contains a not insignificant percentage of precious metals. The ore is of a very fine granular type.

A small research plant was erected at Renström East in 1935 when the sinking of a shaft also began. Investigations were not, however, completed and work ceased in the spring of 1936. Plans for making an investigation of the Renström ores were not resumed until February, 1944, when the decision was reached that an exploration plant be erected at Renström West and that in the first instance, the west ore should be examined.

The shaft was sunk to a depth of 469 m. and the west ore examined at depths of 50, 100, 150, 200, 250, 300, 350 and 400 m. and partly at a depth of 450 m. In 1950 the old wooden headframe was replaced by a new concrete building, which houses ore pockets and hoisting machines. A small auxiliary plant, connected to the headframe, has also been built. This building consists of two storeys of which one is underground and houses, amongst other units, a compressor plant.

Ore production is fixed at 200,000 tons per annum and started on a full scale in the summer of 1953. Cut and fill stoping was chosen as the mining method. The ore mining takes place in longitudinal continuous chambers. On account of the considerable ore widths a pillar has been left between the hanging wall and the foot wall in the A ore area between the 450 and 250 m. levels as well as three pillars in the B ore area. Mining is carried out in three stages. Stage I comprises the ore between the 150 m. level and the surface; stage II the 250—150 m. levels; and stage III the 400—250 m. levels. All stages are being mined simultaneously.

Atlas wagon drills (type BUJ 11) with two chain-fed rock drills type (BBD 41 WK, or RH 656-HW) on each wagon, and ¾ in. tungsten-carbide tipped drill steels are used. The haulage of ore and filling is performed by 40 h.p. scrapers, 1.1 m. in width, with three drums (Boliden type).

The shoots are spaced 40 m. from each other in the fusion between the ore and the rock and are driven in the side rock from the 400 m. level to the surface. Ore haulage takes place only on the 400 m. level.

Above: Drilling with Atlas Copco rock drill type RH-656-4W at Renström

Opposite: Two triple drum 40 h.p. drag scrapers of the Sala type, equipped with 43 in. scraper buckets of Boliden manufacture, in operation at Renström

Ore production at the Renström Mine of the Boliden Mining Company is fixed at 200,000 tons a year. At this property just south of the Arctic Circle, an underground complement of 70 men comprises the entire labour force, output amounting to about 12 tons per man shift.

North Sweden

The filling material used is partly the rock obtained whilst making investigations and preparations, and partly sand and gravel which is available on a ridge south of the Skellefte River. The distribution of filling material is carried out on the 150 m. level and for this purpose a transport tunnel has been driven towards the road along the north bank of the river, where a pocket has been driven up to the surface.

The rock is tipped by means of pneumatically operated tips on the 400 m. level and transported by electric locomotives and Granby wagons, having a 4 cu. m. capacity, to the pocket above the coarse crusher. Tipping and loading are performed by one man per shift. Ore as well as rock are crushed in a jaw crusher (Morgardshammar 10) having a 900 x 1,200 m. intake. There are two pockets under the crusher one holding about 1,000 tons of ore and the other about 850 tons of rock. These pockets terminate in a collecting pocket for the skip filling station on the 450 m. level. The ore runs from the collecting pocket, by way of pneumatically-operated tips, to two measuring pockets, which measure the desired volume of 2 cu. m; i.e. 4 tons of ore. The filling of the measuring pockets, as well as the skips, is accomplished entirely by automatic control; and hence no operating crew is required at the skip station.

Hoisting is with a Koepe hoist with 2.2 m. drum. dia. and double 26 mm. ropes as well as a tail rope. The hoisting speed is 6 m./sec. The skips are emptied automatically, ore is delivered to a pocket, which holds about 800 tons in the shaft tower. Rock is slid over a hinged opening on to the belt conveyor which runs to a dump, whence, via a tip and a chute, it can be brought underground as filling.

Passenger transport is by means of a combined personnel and equipment lift having a maximum loading capacity of 3.5 tons and fitted with counterweight and a tail rope. The hoisting machinery is also a Koepe hoist with 1.9 m. drum diameter. The hoisting speed is also 6 m./sec.

From the pocket the ore is loaded via two chutes on to lorries of A.E.C. manufacture, fitted with trailers, having a transportation capacity, at present, of 30 tons net. The lorries carry the ore the 18 km. distance to the concentrating plant at Boliden.

Average compressed air consumption at Renström is about 30-35 cu. m. per minute. Two Atlas compressors AR4 and one Atlas OK5 are installed in the central compressor station. The compressed air is forced down to the air chamber having a capacity of 2,000 cu. m., on the 380 m. level from where a pipe system runs to the different levels. The air chamber is connected to the cooling water dam on the 300 m. level by a 12 in. pipe.

The flow of water in the mine is very small, about 275 litres per minute. The water is pumped in two stages from a depth of 400 m. up to the surface. The pump stations are located on the 410 and 250 m. levels and consist of a desludging basin and a fresh water basin. Special arrangements have been made to dispose of the sediment sludge in the basins.

A total labour force of 70 men working underground is required for the fixed annual production of 200,000 tons, which means an output of about 12 tons per man shift. The labour force working above ground amounts to about 15 men. There are 10 foremen and office employees at the mine.

Above : Headframe at the Renström mine. With International RDFC-405 lorry of 30 ton loading capacity

Opposite : A 5 ft. tap at Renström, equipped with separate pneumatically operated skimmer. The wagon is a Granby

MECHANICAL CUTTING AND LOADING IN COLLIERIES—II

Roof Support in Power Loading

By J. M. CAW

The various systems of prop setting and advance play a vital rôle in the efficient employment of mechanical mining methods underground.

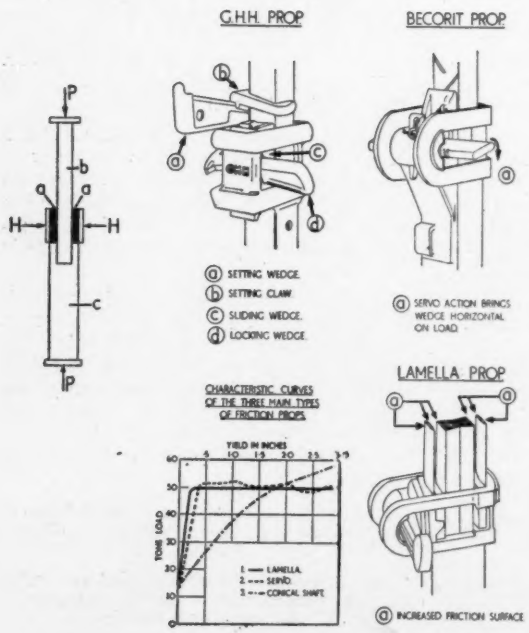
RELAXATION of the requirements of the General Regulations, 1947, covering support of roof and sides will have to be obtained to give room for mechanized mining. This will usually be granted since the number of props can be increased with the removal of the necessity to thread the conveyor through them, the conveyor being close up to the face. Chocks can also be used in the prop line during cutting. Moreover, if the rate of face advance is, in fact, notably increased, roof conditions may well be greatly improved, and the roof will stand over a greater span than previously.

Various systems of prop setting and advance have been devised[5] using moveable beams, extensible cantilevers, hydraulic props working in pairs and joined together by hydraulic cylinders, which can be made to "walk" by manipulating controls in the gate road.

If the seam is thick, the man-hours required on packwork may be considerable, even if pneumatic stowing is used, and caving has much to offer. Caving is a virtual necessity in many cases if coal-getting is to proceed on three shifts. In any event, packing alone does not make good face conditions[6] and cannot rank in order of priority with intensive resistance between the coal face and the goaf line. Caving may be feasible using an intensive propping system without chocks in some instances.

Of the two types of prop the hydraulic type has been described as unduly refined whilst the mechanical type, relying on friction for its correct working, has been called too crude. It is certainly true to say that uneven loading has frequently been observed between individual examples of the latter type working side by side. At the present stage of development the mechanical prop will sustain a load of 50 tons as compared to the 20 tons of the hydraulic, and this offers a useful margin. The characteristics of three designs of friction prop are illustrated below.

Composite illustration showing typical lock boxes and load characteristics

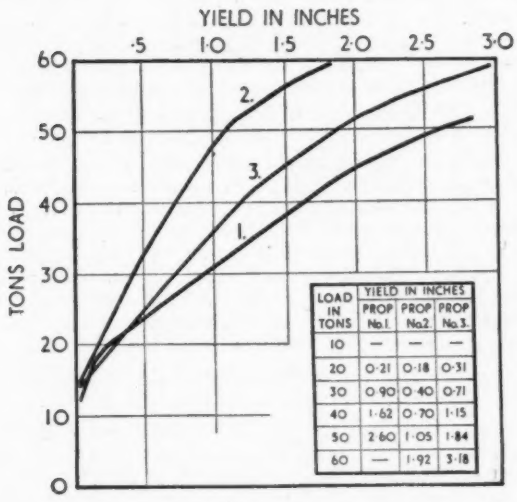


The Lamella and Servo designs have a horizontal loading characteristic and shed their load when it reaches 50 tons. Friction factors are liable to vary during the life of a prop and coal dust on the contact surfaces can lower their coefficient of friction by half.[6] Coal dust and polishing of the surfaces by wear may be the reason for the sometimes irregular performance of these props in use. Experimental work with alloys which has been going on for some time, may result in a more uniform performance from these extremely effective supports. As the load rises and the prop is compressed it shortens until the friction mechanism has fully gripped the extensible member. By the time the maximum working load has been reached the prop has shortened by 2 or 3 in., a characteristic which is seldom desirable.

The characteristics of the floor have a great effect upon the behaviour of prop supports. Tests, which may be made using an hydraulic jack with a pressure gauge head, will give information from which the footplate area required to prevent penetration of the foot of the prop under given load can be found.

An instance[7] is reported, however, where the foot of the prop was sharpened to a point and increasing resistance with greater floor penetration used to increase the prop load, rather than the friction mechanism. This proved to be a successful method of preventing distortion to props working three-quarters extended, on a seam width of 8 ft. 6 in. Cutting, coaling, conveyor turn over, and support work follow each other up the face. There is a danger that some mechanical props of the design described will be distorted if they are subjected to their maximum load when fully extended, and it has been recommended[6] that about one-third of the nominal extension should be kept below the lock.

The ideal method of coal-getting is a continuous one, and although British collieries are limited by the equipment which is available and can be afforded, and are prevented from attaining the desired goal by practical mining diffi-



LOAD IN TONS	YIELD IN INCHES PROP No.1	PROP No.2	PROP No.3
10	—	—	—
20	0·21	0·18	0·31
30	0·90	0·40	0·71
40	1·62	0·70	1·15
50	2·60	1·05	1·84
60	—	1·92	3·18

The load characteristics of used props. G.H.H. props of the DZ type in use from one to three years. Extended length 3 ft. 3 in. after shortening. Taper of inner prop from 1 in 59 to 1 in 71. Set with six heavy blows of 10 lb. hammer

culties of a wide and varied nature, the U.K. organization can be built up and effort made with that final goal in view.

In discussing the machines available for cutting and loading, it is, because of the wide range of working conditions, only desirable to give some idea of the seam thickness and conditions under which work has been done in the past and not to enter too deeply into the local organization of work.

The methods of power-getting and loading can be divided into two main classes:

Ploughs

(a) The standard plough.
(b) The cutter plough.
(c) The rapid plough.
—lobbehobel.
—anbauhobel.
—multi-plough.
(d) The scraper box.
(e) The Huwood slicer.

Chain Machines

(a) The Dosco Miner.
(b) The A.B. Meco - Moore cutter-loader.
(c) The Gloster Getter.
(d) Longwall Cutter and Huwood Loader.
(e) Longwall Cutter with flight loading.
(f) Anderton Shearer-loader.
(g) A.B. Trepanner.

Of the face machines, only the Anderton Shearer runs on the conveyor, the other machines run between the face and the conveyor to which they load. Props can be set temporarily between the conveyor and the face in most cases, should this be necessary.

The ploughs, with the exception of the Huwood Slicer, are suitable for narrow seam working in relatively soft, well cleated coal. Work with the scraper box is possible down to 12 in. seam thickness.

The Dosco Miner is suited to seams down to 4 ft. thick, the remaining machines falling between the extremes.

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The World's Asbestos Resources

Reserves of commercial fibre in the various asbestos-producing areas of the world, together with their political and commercial control, are reviewed in "The Asbestos Industry", by Oliver Bowles, published by the U.S. Bureau of Mines as Bulletin 552

THE Free World production of asbestos is steadily rising and is believed to be in the region of 1,750,000 tons annually. The U.S.S.R. is also a major producer. What are the prospects for obtaining equal or larger quantities of suitable fibre in the years to come?

The United States Federal Geological Survey and the Bureau of Mines estimated in 1944 that U.S. reserves of all grades of chrysotile amounted to about 750,000 s.tons. Since then considerable prospect drilling has been conducted in the deposit operated by Vermont Asbestos Mines near Eden, Vt., to a depth of about 800 ft.; as a result a 20-year supply at the current or even an enlarged production rate seems to be assured. This would imply a reserve of at least 800,000—1,000,000 tons of fibre in this area. A large percentage of the asbestos mined in the Vermont region is of the shorter grades, but further exploration in that State may uncover deposits of longer fibres.

Long fibres of chrysotile of good spinning quality are available in Arizona, but the known reserves are small.

Estimates of reserves are generally confined to the vicinity of producing areas, but there is always the possibility of discovering new deposits. For instance, exploratory work, financed chiefly by the U.S. Government, under supervision of Defence Minerals Exploration Administration, was begun in Trinity County, California, in 1951. Reserves of considerable size may be found in this extensive serpentine belt.

Known reserves of spinning fibres in the U.S. are very small. Aside from those in Vermont, there are no known large deposits of short-fibre chrysotile. Many deposits of amphibole asbestos are known, particularly in Georgia, North Carolina and California, and they are probably adequate to supply the limited U.S. demands for this type of fibre for many years. There are no known reserves in the U.S. of either amosite or crocidolite.

Canada. Estimates of Canadian reserves are incomplete. Much prospect drilling has been done, but only in some instances are the results available. Asbestos Corp., Ltd., the second largest producer in Quebec, has published quite comprehensive data in its annual reports. This company estimated its ore reserves, as of 1953, at a total of 104,650,000 s.tons. Assuming a 6 per cent fibre recovery,

this would indicate a fibre reserve exceeding 6,000,000 tons.

Drill exploration at the Asbestos Corporation's King mine shows asbestos-bearing serpentine to a depth of 1,700 ft. Johnson's Co. has increased its reserves greatly by diamond drilling. Bell Asbestos Mines has purchased a property in Thetford Township, on which it has developed a high-grade 2,000 ft. by 800 ft ore body, which is at least 300 ft. deep.

The Johns-Manville Corp. has conducted extensive prospect drilling for many years. From information supplied by drill ores, it has constructed large models of its undeveloped areas showing quantity and grade of fibres, both laterally and vertically, as a guide to future development. The comprehensive data thus assembled have enabled the company to estimate that it has, within its present holdings, enough available fibre to last at least 100 years at the present rate of mining.

The overall picture of reserves in the Quebec area is indefinite. The heavy investment in facilities and their substantial current enlargement indicate that the principal producers have assured themselves of reserves adequate for continuous operation at the current rate, or on an enlarged scale, for at least 25 or 30 years. Since current production is at a rate exceeding 900,000 tons of asbestos a year, a reserve in the Quebec area of at least 30,000,000 tons seems to be assured, simply on the basis of expectation implied by capital investment and current rate of production. In view of the immense supplies established by exploration conducted by the largest producer, together with probable reserves in unexplored areas, the figure of 30,000,000 tons could probably be doubled or trebled.

It is concluded that Quebec reserves are adequate for half a century of production, even at an increasing rate.

The new development in Munro Township, Ontario, provides a supplementary supply. The reserves are probably extensive but are not as large as those of Quebec. This development has not produced grades and qualities of fibre suitable for textiles. Reserves in British Columbia may be tentatively estimated at 6,000,000 tons running about 7 per cent fibre.

Estimated Soviet Reserves

U.S.S.R. In the early 1930's, when information concerning Russian minerals was more rapidly available, it was stated that extensive and systematic core drilling had established a reserve, for the entire Bajenova district, of more than 3,000,000 tonnes within 50 ft. of the surface. This estimate was based on a 2 per cent recovery; since actual recovery is probably about 4½ per cent, it might easily be doubled. Moreover, the deposits extend far below the 50-ft. level, so that a further substantial enlargement of the figure would be justified. In 1939, the reserves of asbestos in the U.S.S.R. were estimated at 18,000,000 tonnes.

Africa. According to an estimate made in 1928, the reserves of asbestos in Southern Rhodesia then totalled about 7,000,000 tons. During the next 22 years about 1,000,000 tons was mined; however, the rate of depletion has probably been reduced to some extent by enlargement of established reserves through prospect drilling. The 170 and Birthday fibre-bearing rock masses, which are approximately 2,000 ft. long and 100 ft. wide and dip 25 deg., have been proved by drilling to a vertical depth of 1,000 ft. One diamond-drill hole in the Birthday section intercepted rock of good grade at 2.300 ft. The Nil Desperandum deposit has been proved to a depth of 850 ft.

The proportion of fibre of spinning grades produced in the Shabani area is exceptionally high. An estimate as high as 25 or 30 per cent has been made, but in 1949 it was said that 20 per cent of the output would satisfy stockpile specifications, which call for the spinning grades that are designated as C & G Nos. 1 and 2. Since the largest known Rhodesian reserves are in the Shabani area, a reserve of spinning fibres that exceeds 1,000,000 tons may be assumed.

Moderate reserves of chrysotile occur in the Carolina district of the Union of South Africa, but the New Amianthus mine near Barberton, a prolific producer in past years, ceased operations about 1940 because of reported depletion of reserves; however, it has recently been reopened. The nearby Munnik-Myburgh mine, idle for some years, was also reopened, and it is claimed that reserves of considerable extent are available. Chrysotile reserves of considerable extent are known also in the Barberton area.

The crocidolite deposits of the Cape extend over an area 240 miles long, with a maximum width of 30 miles.

The reserves at the Havelock mine in Swaziland are said to comprise 14,000,000 tons of rock carrying 4 per cent of asbestos. This would indicate the presence of over 500,000 tons of fibre. The reserves may, in fact, be greater than these estimates would indicate, because recent exploration has revealed the presence of an extension of the serpentine belt from the Havelock mine south-southwest to the Transvaal border, a distance of 17 miles. A newly developed property adjoining the Havelock mine is said to have a reserve of 2,000,000 tons of rock carrying 5 per cent asbestos.

China. China may have large reserves of asbestos. It was estimated in 1953 that Hopeh Province had a reserve of 400,000 tons.

The World Situation

The world as a whole appears to have adequate asbestos reserves for at least 25 or 30 years at current or moderately enlarged rates of output. U.S. reserves of the shorter fibres are small compared with domestic needs. Of the longer grades the reserves are very small. Canada and Africa appear to have adequate reserves for long-range planning. The U.S.S.R. probably has reserves large enough to supply its domestic economy for many years.

The Russian deposits are under absolute control of the U.S.S.R. All other areas of primary importance are within the political orbit of the British Commonwealth. Deposits of moderate importance outside the Commonwealth are in the U.S., Venezuela, Italy, Finland, China and Japan. Relatively small deposits are controlled politically by Argentina, Bolivia, Brazil, Portugal, France, Turkey, French Morocco, and several other countries.

The only large asbestos producer in the U.S.—Vermont Asbestos Mines—is a subsidiary of the Ruberoid Co. of New York City.

Commercial control of the Canadian asbestos industry is diverse. Several mines are owned by U.S. manufacturers of asbestos products. The largest operation in the world, that of the Canadian Johns-Manville Corp. Ltd., is a subsidiary of the Johns-Manville Corp. of New York City. The mine and mill of the Quebec Asbestos Corp. Ltd. are owned by the Philip Carey Manufacturing Co. of Cincinnati, Ohio. The Bell Asbestos Mines, a large Canadian producer, is controlled by Turner & Newall, Ltd., of Manchester. The Johnson's Co., one of the pioneer operators, is wholly owned by Canadian capital.

Two British companies, Turner & Newall, Ltd., and the Cape Asbestos Co., control a major proportion of the asbestos output in Southern Rhodesia, the Union of South Africa, and Swaziland.

Machinery and Equipment

Centrifugal Force in Analyzing Prospecting Data

The increasing trend of mining operations to exploit large, low grade tonnages often calls for specialized prospecting techniques at a time when little or no information is available on the eventual methods of mill recovery. In the U.S.A., monazite ground as low as 2.5—3 lbs./cu. yd. are reputed to receive attention; on the Plateau in Nigeria a columbite content of 0.3 lbs./cu. yd. is common and ground below this figure has been worked whilst in the Malayan tinfields, ground of the order of 0.25—0.50 lbs./cu. yd. is dredged.

These figures indicate the precision with which prospecting data must be obtained. Yet many low grade alluvial or primary decomposed deposits have a common problem in that it is often necessary to remove substantial quantities of clay from a sample and yet to retain very fine particles of ore, often of fine micron size.

A recent tool developed by Liquid-Solid Separations Ltd., to deal with this problem is the laboratory hydrocyclone the use of which enables samples to be deslimed under standard conditions which can be kept rigidly constant for all samples. The hydrocyclone consists of a conical vessel with an inlet opening arranged tangentially, a small underflow outlet at the base of the cone and a larger overflow outlet at the top of the cone. The liquid or slurry to be classified is fed in through the tangential inlet and by fine adjustment of the underflow and overflow, separations in the size range from 5 microns to 150 microns (100 mesh) can be achieved.

Desliming a sample then consists of puddling a known weight of the ore in a given quantity of water, screening to, say, 100 mesh in water and then feeding this water and the contained solids—passing 100 mesh material—from a small conical tank to the cyclone at a steady pressure. The time saving aspect of these units is reflected in that fact that the 15 and 30 mm. cyclones operate at a feed inlet rate of 0.8 and 3 gals./min. respectively at 40 lbs. p.s.i.

FLANGE FOR USE IN DUST SUPPRESSION

A flange to facilitate the supply of water for dust suppression purposes in the mining industry has been designed in the East Midlands Division, N.C.B. The flange is in extensive use throughout the Division.

The flange is made in two sizes, for use with 2 in. or 2½ in. diameter pipes, and is of similar diameter and thickness to the standard flange used for pipe joints at points where hydrant branches or tee pieces are installed. It is fitted at pipe joints where it is desired to make readily available a supply of water for dust suppression or preliminary fire fighting. Two tappings are made at different points from which water can be taken. Screwed plugs are fitted to seal any tapping from which water is not at the moment required.

MULTI-PURPOSE ROOF BOLTING EQUIPMENT

During the development stages of roof bolting, much attention was given to the design of a range of equipment which would facilitate the rapid emplacement of bolts. The Consolidated Pneumatic Tool Co. Ltd. produce a range of equipment which has been designed for this purpose and yet which allows several of the components to be used in other mine tasks, powered by either compressed air or electricity.

The tools required for this task are the stoper drill, a bolt driver which may be either a stoper-mounted ripper or the CP32 stoper if this is used for drilling, and an impact wrench which transmits no torque, an essential when tightening nuts in an overhead position.

A CP bolt-setting jumbo, which has been widely used in the U.S., is a drill motor which is equipped with two spindles, one inside the other. The outer spindle is a low speed, high-torque motor drive for nut running while the inner spindle operates at high speed for drilling. A built-in clutch gives adjustment of nut running torque and protection against stalling.

Above: A 150 mm. dia. rubber-lined hydrocyclone by Liquid-Solid Separations Ltd. This type is in use for the recovery of fluorspar as fine as 15 microns

Below: Uses of Consolidated Pneumatic impact wrench in a South African mine. At left, employed with extension bar to tighten roof bolts; and at right, without extension piece, the wrench being used to tighten rail clips

MINING MISCELLANY

The Norwegian firm, Veibygg A/L, of Brumendal, has obtained a concession from the Greek Government to mine manganese ore at Larissa, in Central Greece.

★

Mining in Algeria has continued to recover from the setback suffered at the beginning of the year. With the improvement in transport facilities, stocks at the ports of shipment are once more being built up.

★

A zinc-lead ore mine, as well as an ore-enriching works, are being constructed at Trzebionka, Stalinogrod voivodship, Poland. The mine is scheduled to start production in 1959 and when fully in commission will have an annual output of about 600,000 tons.

★

An advance party of an unofficial Malayan commercial and industrial mission to South East Asia is scheduled to leave Singapore on Thursday for Hong Kong. The party consists of 20 businessmen and tin dealers. The mission led by Mr. Ong Chin Seong, a prominent Chinese tin miner, will visit Formosa, Japan and Thailand.

★

The U.S. Court of Appeals decision of February 20, 1956, that western gold miners are entitled to be paid just compensation for taking their gold mining properties under World War II W.P.B. limitation order L-208, interests Alaskan gold mining groups and individuals to the extent of $14,661,881.02 according to the claims so far filed.

★

British Titan Products Co. is to extend still further its production facilities at Grimsby, at an estimated cost of more than £2,000,000. These extensions, which are scheduled for completion during 1958, will raise capacity at Grimsby to 70,000 l.tons of titanium pigments annually—approximately seven times the output of the plant when it first started in 1949.

★

The Southern Coal Producers' Association, which employs about one-third of the soft coal miners in the United States, has agreed to a new wage contract with the United Mine Workers' Union providing for a $2.40 daily wage rise. The agreement is similar to that worked out earlier between the Union and the Bituminous Coal Operators' Association, a larger group.

★

Stimulated by the largest investment programme yet undertaken, Swedish interests promise to double by the early 1960's the present annual output of 9,000,000 tons from the mines in the Arctic zone with an ultimate target of 20,000,000 tons. The ore storage plant at Narvik has been extended to handle 15,000,000 tons per annum and the fleet of ore carriers is being largely augmented.

★

The first consignment of vanadium from the new Otanmaeki vanadium mine near Kajaani, central Finland, has been despatched to France. It comprised five metric tons and commanded a price of 600 marks per kilo.

★

A statistical bulletin, containing all the recorded statistics relating to the mining industry in Malaya, has been published by the Department of Mines, Federation of Malaya. It is intended that this complete presentation shall be published quinquennially and that, for the intervening years, only the details concerning the successive years will be published as an annual supplement.

★

Owners of gold claims in Cuba must start mining operations within six months after being notified by the National Bank of Cuba, or the claims will be taken over by the government, according to a degree issued by the Ministry of the Treasury. The degree gives the bank rights to buy any gold mined in the island. At the same time it prohibits the exportation of gold ore without permission from the bank. Owners of claims taken over by the government will receive a six per cent royalty.

★

Steady progress and expansion in most branches of Tanganyika's mining industry are recorded in the annual report of the Department of Mines for 1955. The total value of all minerals produced was approximately £5,500,000, representing an increase of nearly £500,000. This increase was due largely to the bringing into production in May of a new 1,300-ton a dal reduction plant at the Mpanda lead mine of Uruwira Minerals Ltd. It is estimated that the mining industry expended £3,700,000 on plant and stores during the year and a further £1,429,000 in salaries and wages.

★

Foskor, the State-financed corporation established to work the phosphate deposit at Phalaborwa, in the Northern Transvaal, has decided to investigate further the copper lodes which underlie its claims in this rich area. The ore is being crushed by the existing machinery and the copper is recovered by the same flotation plant which treats the phosphates.

★

Dalhart Minerals is reported to be planning an output of some 44 tons of beryllium oxide monthly, from properties in the Winnipeg River area of Manitoba, Canada. The average grade is expected to be 10-12 per cent, selling at approximately $440 per ton, according to Mr. J. E. Ayrhart, managing director. A leaching plant is also contemplated and given sufficient volume, possibilities of producing beryllium metal would be considered. Whether economic separation of tantalite, uraninite and monazite as by-products would be possible has not yet been determined. Varying quantities of these materials are reported to be associated with the company's beryl deposits.

★

The Olin Mathieson Chemical Corporation is planning to build three large ore carriers for service between Dutch Guiana and its new plant to be built at Burnside, Louisiana, U.S.A. The vessels will be big enough to handle the firm's proposed 180,000 tons a year of alumina operation. No contracts have yet been awarded because of inability to obtain early delivery dates.

★

Exploratory and construction work continue of the Ravensthorpe copper field, in Western Australia, the operating company being Western Uranium Mines N.L. formed to explore for uranium, which has changed over to copper following encouraging diamond drill intersections of copper ore. It is claimed that the intersections in the Mount Desmond-Elverdton copper lode indicate over 1,000,000 tons of ore, and on this work, power, mining and concentrating plant with a capacity of 5,000 tons of ore per month are in course of erection. Underground exploration has not yet been carried out to confirm the drilling results and establish tonnage and value. The field is the most important in Western Australia, and its successful reopening would be important; this will depend upon the proving, by underground exploration, of drill indications.

★

A note in these columns in our issue of October 5 referred to the annual production figures of 12 different mines worked by the Bauxites Parnasse Mining Co. in the Parnasse Mountains about 125 miles north-west of Athens. Owing to a misunderstanding the figures printed should have been in thousands of tons but this essential fact was omitted. We now publish the correct figures with the figures published in our October 5 issue in brackets. The 12 different mines have an annual output of approximately 450,000 (450) tons. During 1955 the company exported 230,000 tons (230) of bauxite to Britain, Germany, Russia, Norway, Sweden and Spain. Exports for January/October, 1956, amounted to 271,000 (271) tons and it is expected that a further 150,000 (150) tons will be shipped this year.

★

Important exploratory work is to be carried out in the metalliferous regions of Western Tasmania by three important mining companies. Electrolytic Zinc Co. of Australasia Ltd. and Rio (Australia) Explorations Pty. Ltd., an offshoot if Rio Tinto Co. Ltd., will prospect a licence area extending from the north coast of the Island to an east-west line north of Macquarie Harbour and extending to the vicinity of Queenstown. Mount Lyell Mining and Railway Co. Ltd. and Electrolytic Zinc Co. of Australasia Ltd. will examine an area of 3,000 sq. miles extending from the southern boundary of the above concession down the West Coast to Port Davey. These licences will exclude existing leases. Aerial survey will be the initial method of exploration, probably using a helicopter, and this will be followed by intensive geological work, operations being confined to the summer months, climatic conditions making such work impossible in the rest of the year. It is reported that an American firm is interested in the investigation of the iron ore deposits on the N-W and W coasts.

Metals and Minerals

Tungsten from China

The loss of tungsten supplies from China, the world's leading producer, and subsequently from Korea, have been largely responsible for the active market in the metal for the past five years. It was responsible, too, for the United States negotiating long-term contracts for the purchase of tungsten at exceedingly high prices which, in turn, encouraged output to expand and led to the discovery of new sources of tungsten-bearing minerals.

However, at the beginning of 1955 Korea came back into the market offering an average of 250 tons through auctions held simultaneously in Seoul, London and Washington. This represents only a small proportion of the country's total output and was absorbed without any difficulty. But the continued offerings of this high-grade scheelite at prices generally below those prevailing in the market, together with increased production elsewhere have, over the last twelve months, gone a long way towards making the metal readily available. In fact, stocks have been built up on both sides of the Atlantic but particularly in the States during the recent steel strike. It was hoped, of course, that demand would re-emerge once the U.S. steel industry was producing at near capacity levels but this has not eventuated and the market lately has been experiencing flat and featureless conditions.

Indeed, the price has fallen some 40s. over the last six months and is now resting at 227s. 6d.-231s. 6d. c.i.f. Europe. At this level there is some resistance to any further downward movement attributed in part to a reluctance on the part of producers, especially in Spain and Portugal to quote lower prices because of economic considerations.

A revival of automobile production in America would provide the market with a new lease of life and no doubt trade circles are anxiously watching Detroit. At the same time, it might be a profitable exercise if one eye was kept on China which, it is reported, has made 9,000,000 schillings worth of tungsten available to Austria under a recent trade agreement. This is the first time a non-Communist country has received tungsten from China since her defection several years ago. Should it presage the beginning of China's re-entry into the market then either new market outlets for the metal will have to be found, or the price must drift to lower levels thereby squeezing out of production many of the small uneconomic producers.

SILVER AT 80d.

The feature in the London bullion market this week has been the strength of the silver price which now stands at 80d. spot and 79⅝d. per f.oz. for forward delivery. This is the highest level since October 20 last year. On October 12, 1955, the peak post-war price was attained of 80⅛d. for cash silver with forward at 80d. per f.oz. The current improvement is attributed to seasonally increased demand for the metal for essential purposes impacting on a market short of supplies on both sides of the Atlantic, due principally to the lack of silver coming from the Far East. In the U.S. Handy and Harman's buying price for silver on October 17 was 91⅛ c. per f.oz.

MAGNESIUM FOR SATELLITE

Magnesium has been chosen as the structural material to be used in the building of the first man-made satellite. Brooks and Perkins Inc., of Detroit, a major fabricator of magnesium, who are making the satellite, stated that in their search they looked for the lightest metal available commercially in sufficient quantities, and one that could be fabricated. Moreover, the metal had to be strong enough to withstand great stress and the terrific temperatures of the upper atmospheres. Tests at the U.S. Naval Research Laboratory showed that magnesium met these requirements.

INDUSTRIAL STONES IN 1955

World production of diamonds, both gem and industrial, in 1955, was approximately 21,540,000 cts. compared with 20,440,000 cts. in 1954. The U.S. Bureau of Mines' report stating these facts also said that of the 1955 production 81 per cent was classed as industrial material. The Belgian Congo with a production of over 13,000,000 cts. continued as in recent years to be the largest diamond producing area by weight as some 71 per cent of the world production of industrial stones were mined in that colony. The import of industrial diamonds into the United States during 1955 totalled 14,944,633 cts. valued at $65,615,907. These figures compare with the import of 13,807,344 cts. in 1954 valued at $48,018,204.

"WELDING" GRAPHITE

Experiments now in progress may lead to the manufacture of electric batteries with an exceptionally long life. The electrically-charged graphite which it is hoped to use for this purpose is a by-product of nuclear reactor furnace construction. It is, in fact, graphite which has been used as "moderator" material in a nuclear reactor and thus exposed to radioactive radiation over a number of years. Although most of the graphite used to build experimental reactor furnaces can be re-used, it is probable that electrically-charged graphite will become available in considerable quantities within the next decade.

At the recent opening of Union Carbide's multi-million dollar research laboratories at Parma, Ohio, it was announced that National Carbon scientists had discovered for the first time in history how to "weld" pieces of graphite together, providing a new technique which promises advances in processing materials for the atomic age. This important development suggests the possibility of prefabricating sheets and panels for the assembly of nuclear reactor moderators.

NEW MANGANESE SOURCES

The manganese deposit near Franceville in Gabon, French Equatorial Africa, believed to be the richest in the world, has never been exploited because of the lack of transport facilities. However, the French company, Comilog (Compagnie Miniere de L'Ogoue) in which the U.S. Steel Company holds 49 per cent of the capital has now decided to work this rich deposit. The transport problem is under consideration and it would appear that its solution will call for a cable railway and a special railway line from Franceville to the coast. Comilog will discuss mining concessions with the local administration before starting on work to develop the site.

Another source of manganese will soon be opened up in the Sungai Aring Valley, 130 miles from Kota Bharu, which is reported to contain rich deposits of manganese ore. These deposits are owned by the Eastern Mineral and Trading Company, a joint Malay-Japanese concern, and it has received government permission to mine manganese and iron at Gual Periok and Tanah Merah in the Pasir Mas district of Kelantan State. Mining will begin shortly for which purpose the Japanese government has agreed to lend the company the equivalent of £58,000 to develop the mines in Kelantan.

FIGURES FROM DETROIT

With so many of the metal markets anxiously watching Detroit for signs of a revival in automobile production, it is of interest to record that during the week ending October 11 production of vehicles in the U.S. totalled 74,014 units, an increase of 19.7 per cent over the preceding week's total output of 59,351 units. These figures compare with the corresponding week a year ago when 108,155 cars were produced. Truck production also increased, 20,483 units against 19,871 units in the preceding week and 24,582 a year ago. Production of cars to-date in the U.S. now totals 4,367,593 units compared with 6,190,024 units a year ago. Truck production to-date totals 870,073 units against 972,406 units a year ago.

FRENCH MOROCCO'S COBALT

French Morocco produced 7,500 tons of cobalt ore in 1955, of which 5,400 tons were delivered to France and 1,700 tons exported. French Morocco is becoming an increasingly important source of this mineral and in order to exploit its resources to the full the Moroccan authorities are considering the construction of a concentrating plant to deal with the local cobalt ores.

COPPER · TIN · LEAD · ZINC

CUSTOM SMELTERS CUT COPPER PRICE

After weeks of very unspectacular trading the world copper markets came to life last week and there was a fairly general decline in values. The fall was touched off by the cut in the R.S.T. price from £300 to £280 a ton which brought this quotation down below the L.M.E. price. Across the Atlantic, American Smelting and Refining formally announced a cut of 2 c. to 37 c. per lb. and was promptly followed by the other custom smelters. In fact the custom smelters had been shading their price below the quoted 39 c. for some time and just before the cut was announced there had been talk of deals made around the 37 c. level.

The big producers are still holding their price at 40 c. With No. 2 scrap a weak 29½ c. the big producers are well out of line, but recent experience shows that they have been as much as 6 c. above the custom smelters and still able to hold their quotation. There is little reason to expect the big producers to jump to follow the decline. It has first to be seen whether business for the custom smelters is going to be more brisk at the lower figure. Secondly, although there is stil no sign of a significant revival in buying by the brass mills, the critical time for Detroit is now at hand; the new models are ready for unwrapping. If the new cars are going to stimulate buying they must begin to do it in the next few weeks. Thirdly, although the Suez crisis is not now so critical—at least in American eyes—as it has been, a new crisis has arisen on the Israel borders. For Americans this is different. Mr. Dulles promised the United States that he would not allow Suez to develop into a shooting war; but he has promised prompt intervention in the event of an Israel-Arab war. On three grounds, therefore, it looks as if the big producers will move cautiously, if they can, for a few weeks.

★

General Cable Corporation—a big maker of copper products—forsees an increase of 20-25 per cent in sales and earnings next year as a result of expanded facilities. In 1955 sales were $129,000,000; in 1956 will be around $190,000,000; and in 1957 are expected to reach $240,000,000.

★

A report in *Pravda* has said that the output of copper from the mines in Kazakstan is to double by 1960. The paper laments inadequate exploitation and calls for open-cast mining.

SPOT TIN UP

In sharp contrast to copper the market in tin has been consistently strong on both sides of the Atlantic. In New York Spot Straits metal climbed to 107 c. per lb. In London, too, the market was firm and a back of well over £20 has ruled. The explanation is the same on both sides—an acute shortage of spot supplies against a statistical background that will remain firm till the Texas smelter is closed. The shortage is attributed in part to the late arrival in the United States of two tin-carrying ships. In the present circumstances pressure on shipping is likely to be a continuing feature in spite of the fact that the Suez Canal is able to handle the reduced tonnages seeking passage. If on the one hand there is no safety margin in supplies, on the other there is a very good demand for tinplate. *The American Metal Market* gives its view that all sections of the industry are well booked and that neither tinplate producers nor consumers are well stocked. "The outlook for 1957 remains exceptionally favourable . . . there is a good chance according to current analysis that capacity output can be sold through the first three quarters of next year."

It is a curious fact that this temporary shortage of supplies should be accompanied by a rush on the part of Malayan tin miners to dispose of stocks of tin. *The Straits Times* calls it "unprecedented". The reason is that the Malayan Government began on October 15 to collect the cess to pay for the buffer stock contribution. A sudden rush of metal to the smelters is not going to alter the squeeze in New York for some time however.

★

Two Bolivian Senators have called for an inquiry into the affairs of the nationalized Bolivian Mining Corporation; they allege bad industrial relations, lack of machinery and spares, government interference and instigation of social unrest. There have been serious riots in La Paz and these have, no doubt, emboldened the Senators to make charges against the dictatorial government. Big changes may be afoot in Bolivia.

★

A. Strauss and Co. comment in their monthly *Review* on the reappearance of offerings of tin from Russia. That Russia has not been a buyer of tin since the war has suggested that native supplies have been worked more effectively, and this view is now borne out by the present export of the metal. However the planned increase in steel production and the planned improvement in living standards (high tinplate consumption and a high standard of living go together) may take care of Russian supplies. It is a probable explanation that the increase in tin production and the increase in tinplate output have got temporarily out of step.

U.S. LEAD FIRM AT 16 C.

Lead has remained in good request in the United States—not perhaps so good as in recent past weeks, but with firm support for the price at 16 c. per lb. Battery makers are still wanting heavy tonnages of metal and while this situation continues the outlook is comforting. The Department of Agriculture has announced that barter contracts have been signed for $1,100,000 of lead. At present market prices this represents about 3,400 tons. It is thought that since the barter programme was started the Government has acquired about 40,000 tons of foreign lead against surplus agricultural produce.

★

It is reported that Bulgaria is increasing lead-zinc output. New ore dressing plants have been installed at Madan and at Rudsem and another plant is under construction at Tshiprovtsi. A new refinery is to be built at Sofia by 1958.

HIGH ZINC BARTER DEAL

The American zinc market has not changed in the past week; the demand for special high grade, especially for die-casting, continues disappointing but interest in prime western grades at 13.50 c. per lb. East St. Louis is fairly good. The news of the week is of the August barter deal in surplus agricultural produce which produced contracts for $26,900,000 of zinc—this would represent about 96,000 tons of zinc. A fabulous amount. Since the August contracts were worth only $28,000,000 virtually the whole of it went on buying up zinc. Around 135,000 tons of zinc have now been contracted for through the barter programme, in addition to the stockpiling of around 285,000 tons of domestic metal.

★

The National Lead Corporation of United States has arrived at agreement in "principal" with the Bolivian government for exploiting the Matilde Mine near Lake Titicaca.

★

Compania Espanola del Zinc is planning the construction of two smelters, one in Vigo and the other in Santander, in addition to the facility it is now erecting in Cartagena. Smelters should be in operation within two years.

The London Metal Market

(From Our L.M.E. Correspondent)

The R.S.T. announced during the weekend that their price would be reduced as from Monday, 15th inst., by £20 to £280 per l.ton c.i.f., electrolytic wirebar basis, thus bringing the price back to the figure at which it was first introduced in May, 1955. This news, and the fact that American custom smelters lowered their price from 39 c. to 37 c. per lb., caused some easing on the London Metal Exchange early in the week, but with some "bear" covering in evidence, the market became very steady at the decline.

Demand from consumers both here and on the Continent has been quiet, while in the U.S. much the same conditions prevail and the sharp revival expected in October has failed to mtaerialize. Whether American producers will be able to maintain their price at 40 c. per lb. is open to some doubt, but they may feel that a reduction just now would not stimulate demand.

Tin has continued a firm market and the backwardation has increased to around £25 per ton. Apart from the only moderate stock here, there is a technical shortage in the nearby position in the market which is a contributory factor. Consumption continues quite good here, and in America the late arrival of some steamers has created a demand for spot material and some English tin is believed to have gone to that quarter. On Thursday morning the Eastern price was equivalent to £811¼ per ton c.i.f. Europe.

The lead and zinc markets have been fairly steady but without any special feature, and the U.S. prices of 16 c. per lb. for lead and 13½ c. per lb. for zinc are held stable by the stock-buying policy.

Closing prices and turnovers are given in the table overleaf.

LONDON METAL AND ORE PRICES, OCTOBER 18, 1956

THE WEEK ON THE L.M.E.

	October 11		October 19	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£283½	£284	£279	£279½
Three months	£282	£282½	£279	£279½
Settlement	£284		£279½	
Week's turnover	7,100 tons		8,475 tons	
Lead				
Current ½ month	£114½	£114½	£115½	£116
Three months	£112½	£112½	£113½	£114
Week's turnover	3,150 tons		3,475 tons	
Tin				
Cash	£789	£790	£809	£811
Three months	£772	£773	£786	£787
Settlement	£790		£811	
Week's turnover	925 tons		795 tons	
Zinc				
Current ½ month	£94½	£94¾	£95¼	£95½
Three months	£92¾	£93	£93¼	£93½
Week's turnover	3,200 tons		3,475 tons	

METAL PRICES

Aluminium, 99.5%, £198 10s. per ton

Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 6s. 11d. lb.

Cobalt, 21s. lb.

Copper, £279½ per ton

ORES AND OXIDES

Bismuth	30% 5s. 0d. lb. c.i.f. 20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable) 48%	£16 15s. 0d. per ton c.i.f.
,, Hard Lumpy (45%)	£16 15s. 0d. per ton c.i.f.
,, Refractory 40%	£10 15s. 0d. per ton c.i.f.
,, Smalls 42%	£13 15s. 0d. per ton c.i.f.
Baluchistan	£17 5s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade	190s./205s. per unit
Lithium Ore —	
Petalite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O	£35-£40 per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 5d. nom. per lb. (f.o.b.)
Titanium Ore —	
Rutile 95/97% TiO_2	£95-£105 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2	£8½-£9½ per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	227s./230s. per unit c.i.f.
Manganese Ore Indian	
Europe (46%-48%) basis 125s. freight	137d. nom. per unit c.i.f.
Manganese Ore (43%-45%)	115d. nom. per unit c.i.f.
Manganese Ore (38%-40%)	110d. nom. per unit. (including duty)
Vanadium —	
Fused oxide 90-95% V_2O_5	£12½-£13½ per unit c.i.f.
Zircon Sand (66-67% ZrO_2)	£18-£19½ per ton c.i.f.
Zirconium Oxide — Calcined Opacifier	£325 1-ton, delivered

Germanium, 99.99%, Ge.kilo lots 3s. 4d. per gram

Gold, 251s. 5½d.

Iridium, £29/31 oz.

Lanthanum (98/99%) 15s. per gram

Lead, £116 per ton

Manganese Metal (96% - 98%) £259/£265 according to quantity

Magnesium, 2s. 4d. lb.

Nickel, 99.5% (home trade) £519 per ton

Osmium, £24/27 oz. nom.

Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.

Platinum U.K. and Empire Refined £34/£35 oz.
Imported £37 15s. nom.

Quicksilver, £83 10s., ex-warehouse.

Rhodium, £42. oz.

Ruthenium, £15/£17 oz.

Selenium, 112s. nom. per lb.

Silver, 80d. f.oz. spot and 79⅛d f'd.

Tellurium, 15s./16s. lb.

Tin, £811 per ton

Zinc, £95½ per ton

LONDON STOCK EXCHANGE PRICES, OCTOBER 17, 1956

Finance	Price Oct. 17	+ or — on week
African & European	3	.....
Anglo American Corpn.	7⅛	+⅛
Anglo-French	22/6	.....
Anglo-Transvaal Consol.	1⅛	.....
Central Mining (£1 shrs.)	59/9	+3d
Consolidated G'fields	60/9	.....
Consol. Mines Selection	1¼	.....
East Rand Consols	1/9	.....
General Mining	3½ xd	—⅛
H. E. Prop.	8/3	—4½d
Johnnies	41/6	—9d
Rand Mines	3½	.....
Rand Selection	1⅛	.....
Union Corporation	39/9	—1/3
Vereeniging Estates	5⅛	+⅛
Writs	1⅛	.....
West Wits	35/3	—6d
Rand Gold		
Blyvoors	21/6	+3d
Brakpan	6/-	.....
Buffelsfontein	27/4½	.....
City Deep	11/-	+6d
Consol. Main Reef	15/1½	+3d
Crown	29/3	+1/-
Daggas	37/6	.....
Dominion Reefs	18/3	.....
Doornfontein	20/9	—6d
Durban Deep	25/6	+6d
E. Champs	3/-	+3d
E. Daggas	8/6	.....
E. Geduld (4s. units)	28/-	+3d
E. Rand Props.	43/9	+7½d
Geduld	3⅛	+⅛
Govt. Areas	3/6	.....
Grootvlei	19/1½	—3d
Hartebeestfontein	41/4½	+6d
Libanon	7/3	+1½d
Luipaards Vlei	9/9	—2/3
Marievale	19/1½	—9d
New Kleinfontein	3/4½	.....
New Pioneer	14/9	+3d
Randfontein	35/3	—3d
Robinson Deep	8/-	.....
Rose Deep	8/6	.....
Simmer & Jack	4/-	.....
S.A. Lands	1⅛	+⅛
Springs	2/4½	.....
Stilfontein	24/4½	+4½d
Sub Nigel	1⅛	+⅛
Vaal Reefs	30/4½	.....
Van Dyk	2/3	.....
Venterspost	12/10½	.....
Vlakfontein	15/10½	+3d
Vogelstruisbult	12/10½	+1½d
West Driefontein	5½	.....

Rand Gold contd.	Price Oct. 17	+ or — on week
W. Rand Consolidated	1½	—⅛
Western Reefs	28/1½	.....
O.F.S. Gold		
Freddies	8/-	+1½d
Freddies Consolidated	3/10½	.....
F.S. Geduld	4⅛	—⅛
Geoffries	7/9	—1½d
Harmony	26/-	—9d
Loraine	5/7½	.....
Lydenburg Estates	15/6	—6d
Merriespruit	6/6	—4½d
Middle Wits	11/-	—1½d
Ofsits	58/6	—9d
President Brand	58/9	+1/10½
President Steyn	33/-	—4½d
St. Helena	28/-	+1½d
Virginia Ord.	9/3	—1½d
Welkom	17/3	—6d
Western Holdings	3⅛	.....
West African Gold		
Amalgamated Banket	1/4½	—3d
Ariston	3/10½	+1½d
Ashanti	16/-	+9d
Bibiani	2/1½	+1½d
Bremang	1/3	.....
G.C. Main Reef	1/9	.....
Konongo	1/6	+1½d
Marlu	1¼d	.....
Taquah	2/1½	+1½d
Western Selection	7/7½	—1½d
Australian Gold		
Gold Mines of Kalgoorlie	13/9 xd	—1½d
Great Boulder Prop.	12/- xd	+1½d
Lake View & Star	16/9	+3d
Mount Morgan	17/3	—1/6
North Kalgurli	7/3	+3d
Sons of Gwalia	2/3	.....
Western Mining	11/-	+1½d
Miscellaneous Gold		
Cam & Motor	7/7½	+3d
Champion Reef	13/-	+7½d
Falcon Mines	7/3	—1½d
Globe & Phoenix	22/-	.....
Motapa	1/-	+3d
Mysore	3/6	—3d
Nundydroog	17/9	+1/3
St. John d'El Rey	52/3	+2/3
Zams	2⅛	+⅛

Diamonds and Platinum	Price Oct. 17	+ or — on week
Anglo American Inv.	9½	+⅛
Casts	25/7½	—9d
Cons. Diam. of S.W.A.	11/-	+6d
De Beers Defd. Regd.	5⅛	.....
De Beers Pfd. Regd.	13⅛	+⅛
Pots Platinum	15/-	+1½d
Waterval	25/6	.....
Copper		
Bancroft	49/9	—1/-
Chartered	77/-	—1/3
Esperanza	3/1½	.....
Messina	9⅛	—⅛
Nchanga	13⅞	—⅛
Rhod. Anglo-American	5⅛	—⅛
Rhod. Katanga	51/9	+4/9
Rhodesian Selection	49/3	—1/3
Rhokana	43½	—⅛
Rio Tinto	4⅛	—⅛
Roan Antelope	27/9	—10½d
Selection Trust	4⅜	+⅛
Tanks	7⅛	+⅛
Tharsis Sulphur Br.	6⅛	+⅛
Tin (Eastern)		
Ayer Hitam	21/6	+3d
Gopeng	12/10½	+6d
Hongkong	6/1½	.....
Ipoh	32/3	+2/3
Kamunting	10/10½	+9d
Kepong Dredging	4/7½	.....
Kinto Tin Mines	21/3	+9d
Malayan Dredging	13/7½	+6d
Pahang	13/10½	+3d
Pengkalen	17/10½	+3d
Petaling	8/-	.....
Rambutan	28/9	+3d
Siamese Tin	13/-	+7½d
Southern Kinta	17/10½	.....
S. Malaya	11/6	+1/4½
S. Tronoh	8/4½	+9d
Sungei Kinta	19/-	.....
Tekka Taiping	7/7½	—4½d
Tronoh	11/7½	+1/1½
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/3	+4½d
Beralt Tin	44/3	—1/3
Bisichi	4/10½	+1½d
British Tin Inv.	24/7½	+4½d
Ex-Lands Nigeria	2/1½	.....
Geevor Tin	17/10½	.....

Tin (Nigerian and Miscellaneous) contd.	Price Oct. 17	+ or — on week
Gold & Base Metal	1/1½	.....
Jantar Nigeria	4/10½	+1½d
Jos Tin Area	12/9	+3d
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/-	.....
London Tin	10/4½	+1½d
United Tin	1/-	.....
Silver, Lead, Zinc		
Broken Hill South	67/6 xd	+6d
Burma Mines	4/3	.....
Consol. Zinc	65/-	—2/-
Lake George	16/1½	+1/1½
Mount Isa	26/-	+1/-
New Broken Hill	52/3	—3d
North Broken Hill	112/6	+4/6
Rhodesian Broken Hill	12/3	—6d
San Francisco Mines	27/9 xd	—1/9
Uruwira	4/4½	.....
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	53/-	.....
Associated Manganese	40/9	—3d
Cape Asbestos	10/1½	+3d
C.P. Manganese	26/3	+2/-
Consol. Murchison	52/6	+7½d
Natal Navigation	62/6	—7½d
Turner & Newall	100/9	+3d
Wankie	16/9	+1½d
Witbank Colliery	5⅛	+⅛
Canadian Mines		
Dome	$25½	.....
Hollinger	$53	.....
Hudson Bay Mining	$167½	+9½
International Nickel	$199½	+1½
Mining Corpn. of Canada	£8⅜	—⅛
Noranda	$116	—1
Quemont	£9½	.....
Yukon	4/6	—3d
Oil		
Apex	44/-	—1/-
Attock	34/6	—6d
British Petroleum	143/3	—3/-
Burmah	89/6 xd	—3/-
Canadian Eagle	65/9	—1/3
Mexican Eagle	24/3	+3d
Shell	152/6	—3/3
T.P.D.	47/9	—1/-
Ultramar	46/1½	—7½d

Mining Finance

A Pleasant Surprise from President Brand

Amongst the quarterly reports from South African gold mining companies in respect of three months ended September 30, 1956, that from President Brand of the Anglo American Group was outstanding. After many months during which it appeared that values from this young O.F.S. property would never again recover to those obtained during 1954—which rose at one time to above 1,800 in. dwt. and averaged about 1,400 in. dwt. over the year—the market received a pleasant surprise in the form of an overall gold content as high as 1,494 in. dwt.

When compared with values over the last year and a half (which averaged just over 1,000 in. dwt.), the extent of the latest rise may be regarded as considerable. But as it is not known from exactly what part of the mine these excellent results were obtained—that is to say what proportion came from the rich area in the vicinity of No. 1 shaft, and how much was attributable to the poorer grade area near No. 2 shaft—it is a little difficult to assess their true significance. Yet it is well known that development has been concentrated for some months to the south of No. 1 shaft and, apart from the unlikely event that this policy was reversed during the past quarter, it appears that work between the shafts has yielded very much higher values than anticipated. It will be recalled that in his statement to shareholders for the year ended September 30, 1955, Mr. Harry Oppenheimer forecast a decline in mill grade. This duly happened. And the question now arises as to whether such development results will continue long enough to enable a recovery.

Such an event would, of course, make a great difference to valuation of Brand's shares. Originally, it will be recalled, when development was in the very early stages, various estimates were made based on an ultimate recovery of up to 20 dwt. per ton. At that time so high a figure may have been unduly optimistic for so new a property—although it was not illogical. Should work during future months consolidate the latest disclosures into a definite trend, another nine months' development could easily have an effect on mill grade.

At present, Brand 5s. shares at around 58s. suggests that the market is looking for an ultimate overall recovery grade of no more than about 15 dwt. And although this figure seems low in comparison with established ore reserve values of nearly 18 dwt., some allowance has to be made for lower values in the southern part of the mine. Yet if for the sake of argument future values continued for any length of time at, say, an average of 1,300 in. dwt., the share price outlook must be favourable. If under present conditions Brand is worth 58s. on a 15 dwt. basis, an improvement to 17 dwt. might raise the price to 90s. Until further development has been done, such thoughts might be premature. But all the same it would be wise to watch closely the future progress of this mine.

In spite of the high initial ore reserve figure of 1,264,000 tons at 16.1 dwt., together with excellent development figures, the quarterly report from Free State Geduld has once again failed to provide the long expected boost to the shares of this company. Yet investors should by now have become resigned to the fact that progress towards opening up large blocks south of No. 2 shaft is necessarily a slow business. Understandable, therefore, is the considerable reluctance towards over-estimating development values so far obtained from a limited amount of work. Nevertheless, that work is being pushed ahead rapidly in this area is quite apparent from figures published over the past nine months. Indeed, during this period from an overall total of 9,050 ft. sampled at the mine, 6,240 ft. (all of which was, incidentally, 100 per cent payable) related to the No. 2 shaft area. Moreover, average values for this work at about 1,600 in. dwt.—although possibly not reflecting the exact position—have certainly been encouraging.

In the absence of any definite information, it is a little difficult to estimate exactly at what point the majority of development south of No. 2 shaft is taking place. But it is fairly certain that substantial efforts will have been concentrated north of the point lying 1,800 ft. from the Western Holdings boundary (where haulages 43 and 41 holed through last May) up to the limit of the Water Zones just south of No. 2 shaft. Thus, some part—at any rate—of the work in progress must have come close to the fabulous borehole GD1 which yielded 23,000 in. dwt. It therefore seems highly unlikely that another quarter can be allowed to pass before the company satisfies what must be its consuming curiosity to examine this section which may well be the key to future O.F.S. share prices. Yet for the moment it must suffice to accept the fact that values obtained have been extremely encouraging. Naturally, in order to justify even the present 89s. price of the company's shares, gold values a good deal higher than this will have to appear in due course.

MARKETS IGNORE GOOD KAFFIR QUARTERLIES

Two weeks ago Wall Street rose but London fell. Last week Wall Street fell but London rose. The traditional sympathetic movement between the two markets has thus not recently been maintained. But apart from their academic interest, the movements were small and probably had little significance.

Over the week the Wall Street's rally was not followed through and the *Dow Jones Industrial Ordinary Index* declined from 488.06 on October 11 to 484.66 by October 17. A 23 year high in the cost of Treasury short-term borrowing highlighted the tight money situation, added to which political uncertainties continued. But business news was generally favourable. Coppers came under pressure following the 2 c. reduction in custom smelters' prices.

London markets were dull and reflected fears regarding the Middle East situation. A widening September trade gap; depressing company statements; and a slowing up of industrial dividend rises affected sentiment. Yet the L.C.C. loan was a great success.

RECENT INTERIM DIVIDEND ANNOUNCEMENTS

Company	*Year Ending*	*Latest Dividend*	*Date Payable*	*This Year to Date*	*Last Year Total*
		%		%	%
G.M.K. (Aust.) (*a*)	.. 31. 3.57	7½	Nov. 16	7½	15
San Francisco Mines	.. 30. 9.56	12½	Sept. 30	12½	40
Broken Hill Prop. (*c*)	.. 31. 5.57	5	Nov. 28	5	10
Gen. Tin. Invests. (*b*)	.. 31.12.56	7	Nov. 7	12	12
General Mining	.. 31.12.56	10	Dec. 4	10	25
Minerals Sepn. (*d*)	.. 31.12.56	10	Nov. 3	10	25

(*a*) Latest dividend on larger capital. (*b*) No further div. will be paid for 1956. (*c*) Australian Currency. In 1955-56 a total of 1s. was also paid on the partly paid shares. (*d*) Increased div. does not necessarily imply greater total for year.

RECENT FINAL DIVIDENDS AND PRELIMINARY FIGURES

Name of Company	*Year Ended*	*Final Dividend*	*Net Profit after tax*		*Total Dividends*	
			This	*Last*	*This*	*Last*
		%	£(000)	£(000)	%	%
Chenderiang Tin	.. 31. 3.56	15	17	15	20	15
Roan Antelope	.. 30. 6.56	65	8,358	5,923	100	80
Mufulira Mines	.. 30. 6.56	85	9,290	6,394	125	100
R.S.T.	.. 30. 6.56	80	4,302	3,452	120	95
Filani Tin	.. 31.12.55	Nil	Dr. 1	5	Nil	22½
Renong Tin (*b*)	.. 30. 6.56	30	40	99	45	65
Tanganyika Conc.	.. 31. 7.56	75	3,983	3,001	90	70
Lon. & Afr. Mining	.. 30. 9.56	16¼	39	38	16¼	15
Perak Hydro-Elec. (*c*) ..	.. 31. 7.56	6	288	320	10	10
Tronoh Mines (*d*)	.. 31.12.55	7½	430	293	47½	95

(*a*) Past year's dividends on large capital. (*b*) Previous year's total included 20% bonus. (*c*) Net Profit figures after depreciation. (*d*) Past year dividends on £1,000,000 capital (80% on £300,000 and 15% on £1,000,000).

Good quarterlies once more left the Kaffir market unimpressed. The *Financial Times Gold Share Index* declined from 77.6 to 76.2 over the week and most O.F.S. shares lost the turn. Against this trend President Brand moved up about 9d. on the excellent report.

Small gains were suffered by coppers which mainly resulted from the lower metal price. The higher dividend from Tanks left the price unchanged while speculative interest in Rho-Kats was strongly revived. Apart from Anglo-American Investment which put on about 1s. 6d., diamonds were little altered. Oils were slightly down. But Malayan Tins established widespread gains.

In the miscellaneous section St. John d'El Rey touched 53s. while Indian golds were strong. S.W. Africa Company rose almost 2s. 6d. on higher lead-zinc production during the September quarter.

TANKS' DIVIDEND UP 20 PER CENT

After recent declarations from Rhodesian Copperbelt producers, the increase in final dividend to 75 per cent from 55 per cent on Tanganyika Concessions' issued ordinary capital of £3,831,412 in 10s. stock units, has come as no surprise. Together with an interim payment of 15 per cent, total distribution for the year ended July 30, 1956, is thus raised to 90 per cent from the previous figure of 70 per cent.

Largely reflecting the increase in distribution to 2,200 from 1,600 Belgian francs from Union Minière—in which Tanks has an extremely large holding—the company's profit for the past financial year rose markedly to £3,982,612 from £3,000,830. After dividends on preference and ordinary stocks which absorbed collectively £3,595,841, as against £2,829,558, unappropriated profits moved up to £2,290,533 from £1,903,290. Yet two items which figured prominently in 1955 provided no additional revenue during the past financial year. The first of these was a sum of £579,302 representing debenture interest arrears received from the Benguela Railway Company, and secondly, a provision for loss on Tanganyika Holdings of £100,000 which was written back. Against this, however, taxation provisions in respect of previous years brought in a credit of £472 last year compared with the large debit of £279,511 previously. In addition, a profit on redemption of Benguela Railway debentures amounting to £506,000 was credited to capital reserve. The corresponding amount under this heading for 1955 was only £168,700.

Sir Ulick Alexander is chairman. Meeting January 24, 1957.

REVISED CAMP BIRD OFFERS

Although over 75 per cent of replies received to Camp Bird's recent press announcement concerning the acquisition of 18 Malayan tin companies were in favour of the share exchange proposal, a large number of shareholders considered the published basis to be inadequate. The bids have accordingly been revised upwards as stated in the table below.

Kinta Tin—4 Camp Bird for 3 Kinta.

Gopeng Cons.—5 Camp Bird for 6 Gopeng.

Kent (F.M.S.)—3 Camp Bird for 10 Kent.

Pengkalen—4 Camp Bird for 3 Pref. Ord. Pengkalen; 6 Camp Bird for 5 Pengkalen Ord.

Rambutan—2 Camp Bird for 1 Rambutan.

Tekka—1 Camp Bird for 2 Tekka.

Chenderiang—4 Camp Bird for 3 Chenderiang.

Referring to the above offers, the Boards of all seven companies concerned have pointed out that, on the face of it, there would appear to be no advantage whatsoever in the new proposals. Furthermore, clarification will be required on some points which have arisen. In the circumstances, stockholders have been advised agianst taking any action for the present. In view of the unattractive nature of these bids *viz-à-viz* present market prices, this would certainly seem to be the wisest course to adopt.

At an extraordinary meeting of Camp Bird held earlier in the week a proposal to increase the capital of the company from £2,310,000 to £5,000,000 was authorized.

Ipoh Tin.—Also involved in Camp Bird take-over proposals Ipoh Tin has announced a proposal to return 8s. per 16s. stock unit.

Higher Dividend From Wankie.—With a final dividend recommendation of 7½d. on the issued ordinary capital of £4,412,500 in 10s. shares, Wankie Colliery Company is raising its dividend for the year ended August 31, 1956, to 1s. per share (10 per cent) from the previous total of 10½d. (8½ per cent). Profits for the past financial year after all charges including debenture interest and taxation came out at £891,647 compared with £824,012. An amount of £105,000 against £100,000 was transferred to taxation equalization reserve, and £250,000—the same as for 1955—was appropriated to general reserve.

KINTA KELLAS TIN DREDGING

ANTICIPATED RESULTS REALIZED

MR. P. J. BURGESS ON LABOUR PROBLEMS

The 29th annual general meeting of Kinta Kellas Tin Dredging Company, Limited, was held on October 12 in London, **Mr. P. J. Burgess** (the Chairman) presiding.

The following is an extract from his circulated statement:—

In my statement to you last year, I referred to the course of the dredge being modified by dropping the unprofitable corner of our tin field. This was done and the anticipated results for the 12 months now under review were realized, a reasonable profit of £19,297 was made and we now recommend the payment of a modest dividend of 10%, and so return to the dividend paying list.

Last year, our financial position had been seriously weakened by the cost of carrying out the extensive mechanical improvements to the dredge in 1954 and we are now taking the first opportunity of strengthening our finances by placing £20,000 to the General Reserve. We carry forward £20,607 in the Profit and Loss Account, which is £2,784 less than was brought in from last year.

Tin Agreement

The price of tin has continued to be reasonably stable, with a tendency to rise during 1955. The average figure for the first six months of 1956 is satisfactory for operating on a medium grade of ore such as we possess.

The International Tin Agreement, designed to stabilise the price of tin at a level satisfactory to both producers and consumers, became operative on July 1 of this year. The agreement provides for a buffer stock of tin financed by contributions of tin or cash from the producers in accordance with the assessment of their individual capacities to produce. We have not yet received notice of our assessment and, until we know what we are allowed to produce, we can make no estimates for the more distant future than the few months ahead. We can only take the common sense view that we shall be given a sufficiently liberal assessment to allow of working at a profit.

Labour Unrest

The unrest affecting the labour force has become a disturbing factor in Malaya. One fundamental cause of the labour trouble may very likely be the general rise in prices and the corresponding drop in the value of money. This effect is very marked in the relation between the nominal issued capital of old - established Companies and the present-day replacement value of their assets and equipment. The replacement value is usually many times that of the issued Capital, so that profits and dividends bear an exaggerated appearance when calculated and paid on the original capital.

The report was adopted.

BLYVOORUITZICHT GOLD MINING COMPANY, LTD.

(Incorporated in the Union of South Africa.)

AUTHORISED CAPITAL	**£3,300,000**
ISSUED CAPITAL (24,000,000 Shares of 2/6 each)	**£3,000,000**

Extracted from the Annual Report for the Year ended 30th June, 1956.

Tons Milled 1,267,000. Gold Produced 713,208 oz. fine.

		Per ton milled
Working Revenue	£8,958,372	£7 1 5
Working Expenditure	3,751,080	2 19 3
Working Profit—from Gold, etc.	5,207,292	4 2 2
—from Uranium (subject to adjustment)	1,192,764	18 10
Total	6,400,056	£5 1 0
Expenses *less* Sundry Revenue	72,471	
	6,327,585	
Taxation (£2,564,969) and **Mineral Lease Consideration** (£578,112)	3,143,081	
Profit after Taxation and Lease Consideration	3,184,504	
Balance of Income and Expenditure Account at 30th June, 1955	1,478,075	
		£4,662,579
Funds transferred for expenditure on mining assets and trade investments	264,890	
Repayment on account of Capital portion of uranium loan	362,680	
Dividends declared—Nos. 20 and 21 each of 1s. 0d. per share	2,400,000	3,027,570
Balance of Income and Expenditure Account at 30th June, 1956		£1,635,009

The **Ore Reserve** was re-estimated at 30th June, 1956. This estimate together with that of the previous year is as follows:—

Carbon Leader Reef	Available			Shaft and Safety Pillars			Total		
	Tons, 000's	Value, Dwt.	Width, Inches	Tons, 000's	Value, Dwt.	Width, Inches	Tons, 000's	Value, Dwt.	Width, Inches
30.6.1956	5,341	12.1	46.4	1,524	11.9	45.7	6,865	12.1	46.2
30.6.1955	5,191	12.1	46.4	1,661	12.2	45.8	6,852	12.1	46.2

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4, London Wall Buildings, London, E.C.2.

Metal and Mineral Trades

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